

REMARKS

The Office action of April 7, 2004 has been received and its contents carefully noted.

In amended FIGs. 12-15, a label of "Conventional Art" has been added.

Claims 1-14 are pending in the application. Claims 9-10 have been amended. Claims 11-14 have been added without the addition of any new matter.

Claims 5 and 10 stand rejected under 35 U.S.C. § 102(e) as being unpatentable over Ooi et al. ("Ooi") (U.S. Patent No. 6,362,913). Claims 1, 4, and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Admitted Prior Art ("AAPA"). Also, Claims 1, 4, and 8-9 stand rejected under § 103(a) as being unpatentable over Ooi. Claims 2 and 6 stand rejected under § 103(a) as being unpatentable over Ooi in view of Miyamoto et al. ("Miyamoto") (U.S. Patent No. 6,559,996). Claims 3 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ooi in view of Jabr (U.S. Patent No. 6,229,632). Applicants respectfully traverse these rejections, and request allowance thereof in the continuation prosecution application for the following reasons.

The Present Claims are Patentable Over the Cited References

Claims 5 and 10 are not anticipated by Ooi

Claims 5 and 10 were rejected under § 102(b) in view of Ooi. Ooi fails to disclose the features recited in these claims such as an optical transmission apparatus including an error signal generating unit which generates an error signal of a bias voltage for maximizing a value of the frequency component two times that of the driving signal extracted by an extracting unit, and a bias voltage control unit which applies a bias voltage added with an error signal of the bias voltage to an optical modulator.

Ooi fails to disclose these patentably distinct features. In contrast, Ooi discloses extracting a low-frequency component (using phase comparator 57c and low-pass filter 57d) to generate a bias voltage using bias supply circuit 58 (essentially an inductor L), but does not disclose the recited combination of an error signal generating unit and a bias voltage control unit as recited. (see FIGs. 1, 7, 25; col. 15, lines 1-8, 63-67; col. 16, lines 1-10).

The Action appears to attempt to argue that the combination of the phase comparator 57c, the low-pass filter 57d, and the bias supply circuit 58 disclosed by Ooi are equivalent to the recited features of the error signal generating unit and the bias voltage control unit, but they are not equivalent. In contrast to the claimed invention, the combination of the phase comparator 57c and the low-pass filter 57d disclosed by Ooi simply acts as a signal

extracter to extract the desired low-pass signal component from the output signal generated by the optical modulator 52 via photodiode 57a.

Specifically, Ooi states that "...the phase comparator 57c...extracts the low-frequency signal from the photodiode output by a phase comparison and inputs the extracted low-frequency signal to the bias supply circuit 58." (see FIGs. 1, 7, 25; col. 16, lines 2-8). This combination of a phase comparator and low-pass filter disclosed by Ooi does not do anything more than low-frequency signal extraction, and certainly does not perform the further recited feature of generating an error signal of a bias voltage for maximizing a value of the frequency component two times that of the driving signal extracted by an extracting unit.

Also, the bias supply circuit 58 disclosed by Ooi is not equivalent to the recited bias voltage control unit which applies a bias voltage added with an error signal of the bias voltage to an optical modulator. In contrast to the recited feature, the bias supply circuit 58 disclosed by Ooi is simply an inductor circuit which receives the input low-frequency signal from the low-pass filter 57d to generate the output bias voltage Vb1.

Specifically, Ooi states that "...the bias supply circuit 58, which is constituted by a bias tee 58a...the bias tee 58a has a coil L, which is for supply the signal electrode 52a of the optical modulator with the bias voltage Vb1..." (see FIG. 7 col. 15, lines 1-

8). There is absolutely no mention in Ooi of adding this bias voltage with an error signal for input to the optical modulator in contrast to the recited feature.

The disclosure of Ooi does not anticipate or make obvious the recited features of an error signal generating unit which generates an error signal of a bias voltage for maximizing a value of the frequency component two times that of the driving signal extracted by an extracting unit, and a bias voltage control unit which applies a bias voltage added with an error signal of the bias voltage to an optical modulator.

Claims 1, 4, and 9 are not made obvious by Admitted Prior Art

Claims 1, 4, and 9 were rejected under § 103(a) in view of Admitted Prior Art (AAPA). The AAPA fails to disclose the features recited in these claims such as an optical transmission apparatus including an error signal generating unit which generates an error signal of a bias voltage for minimizing a value of a frequency component of the driving signal extracted by an extracting unit. Clearly, when comparing the AAPA of FIGs. 12-15 with the novel features illustrated in FIGs. 1-11, the recited error signal generating unit is not disclosed by the AAPA.

Contrary to what is stated in the Action, there is absolutely no mention nor illustration of the recited error signal generating unit in FIGs. 12-15 or within the Background of the Invention

(pages 1-10). Instead, the Background of the Invention mentions there is still a need to control the stability of the bias voltage of an optical modulator (see page 10, lines 14-20) and the claims recite features which are not disclosed by the AAPA which include an error signal generating unit which generates an error signal of a bias voltage for minimizing a value of a frequency component of the driving signal extracted by said extracting unit, and a bias voltage control unit which applies a bias voltage obtained as a result of addition of the bias voltage and a voltage corresponding to the error signal to said optical modulator. These recited features are not anticipated nor made obvious by the AAPA.

Claims 1, 4, and 8-9 are not made obvious by Ooi

Claims 1, 4, and 8-9 were rejected under § 103(a) in view of Ooi. Ooi fails to disclose the features recited in these claims such as an optical transmission apparatus including an error signal generating unit which generates an error signal of a bias voltage for maximizing a value of the frequency component two times that of the driving signal extracted by an extracting unit, and a bias voltage control unit which applies a bias voltage added with an error signal of the bias voltage to an optical modulator.

As contended above, Ooi discloses an extractor for a low-frequency component to be fed to a bias supply circuit comprising an inductor to generate a bias voltage. This disclosure of Ooi

does not make the recited features obvious.

Claims 2 and 6 are not made obvious by Ooi and Miyamoto

Claims 2 and 6 were rejected under § 103(a) in view of Ooi and Miyamoto. Ooi and Miyamoto, either alone or in combination, fail to disclose the features recited in these claims such as an optical transmission apparatus including an error signal generating unit which generates an error signal of a bias voltage for maximizing a value of the frequency component two times that of the driving signal extracted by an extracting unit, and a bias voltage control unit which applies a bias voltage added with an error signal of the bias voltage to an optical modulator.

As contended above, Ooi discloses an extractor for a low-frequency component to be fed to a bias supply circuit comprising an inductor to generate a bias voltage. This disclosure of Ooi does not make the recited features obvious. Further, Miyamoto discloses a method for reducing optical signal bandwidth in an optical transmission system using a return-to-zero (RZ) signal which does not make the recited features obvious.

Claims 3 and 7 are not made obvious by Ooi and Jabr

Claims 3 and 7 were rejected under § 103(a) in view of Ooi and Jabr. Ooi and Jabr, either alone or in combination, fail to disclose the features recited in these claims such as an optical

transmission apparatus including an error signal generating unit which generates an error signal of a bias voltage for maximizing a value of the frequency component two times that of the driving signal extracted by an extracting unit, and a bias voltage control unit which applies a bias voltage added with an error signal of the bias voltage to an optical modulator.

As contended above, Ooi discloses an extractor for a low-frequency component to be fed to a bias supply circuit comprising an inductor to generate a bias voltage. This disclosure of Ooi does not make the recited features obvious. Further, Jabr discloses a method for differential wavelength modulation in an optical transmission system which does not make the recited features obvious.

Conclusion

In view of the amendments and remarks submitted above, it is respectfully submitted that all of the remaining claims are allowable and a Notice of Allowance is earnestly solicited.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayments to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Application No. 09/892,918

The Examiner is invited to contact the undersigned at (703)
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Respectfully submitted,

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Attachment: Four (4) Replacement Drawings